

**ABSTRACT OF THE DISCLOSURE**

A corrosion resistant component of semiconductor processing equipment such as a plasma chamber comprises a cerium oxide containing ceramic material as an outermost surface of the component. The cerium oxide containing ceramic material comprises one or more cerium oxides as the single largest constituent thereof. The component can be made entirely of the cerium oxide containing ceramic material or, alternatively, the cerium oxide containing ceramic can be provided as a layer on a substrate such as aluminum or an aluminum alloy, a ceramic material, stainless steel, or a refractory metal. The cerium oxide containing ceramic layer can be provided as a coating by a technique such as plasma spraying. One or more intermediate layers may be provided between the component and the cerium oxide containing ceramic coating. To promote adhesion of the cerium oxide containing ceramic coating, the component surface or the intermediate layer surface may be subjected to a surface roughening treatment prior to depositing the cerium oxide containing ceramic coating.